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ABSTRACT

This paper describes the efforts of the Program on Teacher Effectiveness of the Stanford Center for Research and Development in Teaching to survey and catalog available teacher training products. It is stated that the project developed from the program's own need to identify potential products which could be incorporated into the program's Systematic Teacher Training Model--a flexible training system for preservice and inservice teachers. The paper defines teacher training products and describes the identification of products. In a section on what makes up a "flexible catalog," the following categories are outlined: developers, subject matter specificity, target audience, grade level specificity, target outcomes for teachers and for students, availability, nature of the training situation, and field test results. The final section describes the uses of a computerized catalog. (JA)

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CATALOGUING TEACHER TRAINING MATERIALS IN A COMPUTERIZED RETRIEVAL SYSTEM: SEPARATING THE BABY FROM THE BATH WATER*

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CATALOGUING TEACHER TRAINING MATERIALS IN A COMPUTERIZED RETRIEVAL SYSTEM: SEPARATING THE BABY FROM THE BATH WATER

The recent passage of legislation in a number of states requiring the conversion of traditional teacher training programs to competency-based programs has resulted in a flurry of product development activity. The outcome might be viewed as similar to the "baby boom" of the 1950's. Products of "first generation" Competency-Based Teacher Education (CBTE) have been bursting forth, and there have been no existing institutional mechanisms for dealing with the burgeoning population. Although projections could have been made, no one has known for sure how many products are in existence, what type of products are available, or who are the developers. This chaotic state has affected product developers who have been unwittingly duplicating one another's efforts and teacher educators who have been confronting the task of assembling teacher training programs from an undifferentiated multitude of products. Clearly, in order to separate the baby from the bath water, there has been a need for a census.

This paper describes the efforts of the Program on Teaching Effectiveness of the Stanford Center for Research and Development in Teaching to survey and catalog available teacher training products (Program on Teaching Effectiveness, 1974). The endeavor developed from the Program's own need to identify potential products which could be incorporated into the Program's Systematic Teacher Training Model -- a flexible training system for preservice and in-service teachers. The results of the cataloguing activity have implications for the future of research on teaching, product development, product evaluation, and competency-based teacher training.

The Process of Product Description and Cataloguing

A Definition of Teacher Training Products

For the purposes of the collation, a definition of "teacher training product" was necessary--one that would guide the search in appropriate ways.

In the definition that was selected, teacher training products must require that the trainee be active, in the sense of performing, practicing, or trying out the skills to be acquired. Such a requirement excludes training materials that merely ask the trainee to receive information through reading, listening, or viewing.

Accordingly, protocols were not considered teacher training products for our purposes. Although many protocol products do require active conceptualization, the experience necessary for transfer to actual teaching situations does not necessarily develop from the isolated use of protocols. Integration of protocol-like elements occurs in many of the products reviewed however.

Product Identification and Description

Because much work had already been done elsewhere in cataloguing teacher training products, the program was able to use eight catalogs already in existence. Since our definition required trainee activity, many entries in these catalogs were not relevant. Furthermore, because these resources overlapped substantially, the set of products was reduced. Each catalog duplicated from 25 to 75 percent of other catalogs' entries. The catalogs also shared certain weaknesses. Field test information on product effectiveness was seldom included. When it was, the information was often written as an advertisement rather than as an objective report of information. This shortcoming probably reflected a lack of substantial field testing. Existing resources lacked cross indexes for titles, suppliers, developers, and product objectives. Nevertheless, the catalogs provided a new way of identifying teacher training products on a large scale.

Another device for identifying products was a mail campaign. A letter describing the product identification effort was sent to 1200 public and private universities and colleges, school districts, private research institutions, and federal research and development centers and laboratories. About 10 percent responded leading to the identification of approximately 100 new products.

Finally, an advertisement was placed in the Educational Researcher, but the advertisement resulted in no additional product identifications.

In order to describe the important features of teacher training products, a Teacher Training Product Description Form was developed. The staff proposed categories and then added descriptors from existing catalogs. Using these descriptors, the program staff filled out the Form from information in existing catalogs. A copy of the completed form was then mailed to the developer for verification. Approximately 45 percent of the descriptions were verified in this way.

A Flexible Catalog

As the review of the products proceeded, it became apparent that it would be desirable to have a catalog that could be updated as new products appeared. A flexible catalog was realized through the use of a computer information storage and retrieval system which allows a user to create, update, maintain, interrogate, and display stored information. With the computer retrieval system, rapid tabulation and analysis became possible. Furthermore, the computer system provides an indexing and search capability which permits the retrieval of lists of teacher training products according to any combination of descriptors on the Product Description Form.

Although approximately 800 teacher training products were identified and described, only 657 products were described with sufficient completeness to be entered in the computerized catalog. The analysis which follows is therefore based on a total of 657 teacher training products.

Structure of the Field of Teacher Training Products

The frequencies and percentages of products having various characteristics will be described and discussed under the following nine categories: developers, subject matter specificity, target audience, grade level specificity, target outcomes for teachers and for students, availability, nature of the training situation, and field test results. The frequencies throw light on the nature of the concerns and the efforts of the developers of the hundreds of teacher training products thus far developed in the United States and identified by this project. The frequencies were calculated from the Product Description Form filled out by the project analysts.

A copy of the Description Form showing the frequency of products for each descriptor is presented in Appendix A.

Developers

The 554 products described in the catalog for which the developers have been identified were produced by 265 different developers. The developers included individuals, teams, and organizations in university, school system, government, and business contexts. The support contexts in which teacher training products have been developed are presented in Table 1. Universities far exceeded any other institutions as sites in which product development took place, accounting for 64 percent of the products developed, while the fewest number of products, 3.5 percent, were developed by private organizations. School systems presumably could use a large number of training products in their inservice programs, yet they produced only 7 percent or 46 of the 554 products. With the exception of the Florida State Department of Education which produced 31 of the 46 products, school systems do not seem to allocate the resources necessary to develop products.

Subject Matter Specificity

The category of subject matter specificity deals with whether the teacher training product was aimed at teachers of a particular subject matter. It was found that no subject matter specificity was indicated for 66 percent of the products described. The four most frequently specified subject matters were reading, social studies, mathematics, English language skills, with considerably fewer products aimed at the fields of science, music, art, foreign language, and bilingual or multicultural education.

These results indicate that the developers of teacher training products typically regard teaching as an activity that can be formulated in terms that are not specific to a given subject matter. The issue of whether teaching can be considered in general terms or must always be considered in ways specific to a given subject matter has been actively debated among theoreticians and practitioners in teacher education for decades. The present results indicate that the substantial majority of the teacher training products developed to date reflect this generalist position. The validity of this position cannot be determined by these findings. However, it is clear that in

the judgment of the developers of teacher training products it makes sense to attempt to change or improve teacher behavior without reference to a specific subject matter area.

Target Audience

The category of target audience refers to the kinds of trainees at whom the teacher training product is aimed. The seven descriptors in this category are not mutually exclusive. It was found that the vast majority, i.e., 91 percent of the products were intended to be used by preservice trainees. An almost equally large percentage of the products were intended to be used by in-service teachers. A cross-tabulation of these two descriptors indicated that of 597 products intended for in-service teachers, 505 were designed to be used by both pre- and in-service teachers. This figure indicates that the distinction between preservice and in-service trainees is not sharply maintained. Apparently, products described as appropriate for persons who have never yet taught are also likely to be seen as appropriate for certificated teachers.

Although the identification effort was intended to be concerned entirely with teacher training products, about 10 percent of the products were also intended to be suitable for the training of administrators, supervisors, and teacher educators, and about an equal proportion were intended to be useful for teacher aides.

Grade Level Specificity

Grade level is another major dimension, comparable to subject matter, by which teaching is often considered to need differentiation. Teachers of senior high school students are often regarded as requiring skills that are different, to a considerable degree, from those needed by teachers in the early grades of the elementary school. Yet nearly 50 percent of the products were described as useful for teachers in general, without regard to grade level. Products useful for training elementary grade level teachers were next most frequent, comprising 44 percent of the products. Again, as with the target audience category, the eight descriptors in the category of grade level specificity were not mutually exclusive. The products described as useful for secondary and junior high school teachers each comprised approximately 18 percent, while very few of the products were designed to be used by junior college teachers, college teachers, or early childhood teachers.

A cross-tabulation of the products intended for junior high school teachers and secondary school teachers indicated that the distinction between junior and senior high school teaching seems to be maintained in only about half of the cases. A cross-tabulation of the products intended for elementary teachers and secondary teachers indicated that of the 288 products intended for elementary teachers and the 119 products intended for secondary teachers, only 79 were intended to be useful to both. That is, a distinction frequently is made between teacher training products depending on whether the teacher is going to work with elementary or secondary school children.

Target Outcomes for Teachers

The category of target outcomes for teachers--largely skills--refers to the kinds of teacher behavior that the training product is intended to introduce or improve. For the purposes of the present work, the following four categories of teacher skills were developed: planning skills, presentation skills, skills in the unplanned aspects of teacher behavior, and assessment and evaluation skills. Within each of these categories, skills were listed at a level of specificity considered appropriate to that used by the developers of the products. The level of specificity of descriptors in the Product Description Form was intended to promote comprehensive description of teacher training products and to permit translation of the developers' descriptions into our terminology. A category of teacher affective outcomes was also included.

Planning skills. The category of planning skills includes skills that teachers need to use before they meet their students. A total of 11 such planning skills were considered in the analysis of the products. Of these planning skills, the three at which products were most frequently aimed were "selecting instruction process strategies," "preparing instructional materials," and "selecting instructional materials."

Presentation skills. "Presentation skills" are the skills that one typically considers to be part of the "classroom recitation" process--listening, explaining, questioning, giving examples, pacing, introducing, sequencing, and so on. A total of 25 such presentation skills were considered in the analysis of the products. Of these presentation skills, the two skills with which the most products were concerned were "motivating"

and "reinforcing." 19 percent of all the products were aimed at "motivating" and 17 percent were aimed at "reinforcing." Other skills most frequently addressed were "individualizing instruction," "questioning," "eliciting feedback," "explaining," and "using groups."

Skills in the unplanned aspects of teacher behavior. This category of eight descriptors deals primarily with skills involved in interacting with others. Of these unplanned skills, the two at which products were most often aimed were "informal interaction with students" and "providing feedback." Although teachers have frequently expressed a need for skills in classroom management (Lagana, 1970), only 7 percent of the products were found to focus on managing student behavior.

Assessment and evaluation skills. Assessment and evaluation skills are used by teachers in determining the degree to which students possess certain kinds of abilities or habits before, during, and after instruction. Twelve descriptors were included in this category. "Preparing objectives" was, by far, the most frequent target of a teacher training product with 28 percent of the products dealing with this skill. Assessment and evaluation of student cognitive behavior were the next most frequently addressed skills.

Affective outcomes. The concern here was with the effects of teacher training products on attitudes and other social-emotional behaviors of the teacher. Nine descriptors were included in this category. The most frequent types of outcomes were influencing teachers' "attitudes toward students," improving the teachers' "attitudes toward teaching," and "motivation to achieve."

Other skills. Several intended outcomes in teacher skill and behavior did not fit into any of the aforementioned categories. These "other skills" were the targets of 159 teacher training products. Of these, the most frequent "other skill" was "developing subject-related skills."

Target Outcomes for Students

Teacher training products are intended to improve teaching behaviors and skills, not as ends in themselves, but as means toward improving educationally significant student behaviors, such as knowledge, understanding, and attitudes. This principle demands that teacher training products be evaluated, insofar as possible, in terms of their effects on outcomes in student behavior.

Target student outcomes were classified as "cognitive" or "social-emotional," i.e., "cognitive" refers to intellectual objectives of education,

and "social-emotional" refers to objectives that include the student's emotional adjustment, ability to get along with others, interest, motivation, beliefs, attitudes, and the like.

Of the 218 products for which cognitive outcomes were considered to be the targets, the three most frequently occurring descriptors were "acquisition of information," "comprehension of information," and "application of information." The two least frequently occurring descriptors were "creativity" and "intellectual independence."

Of the 142 products for which social-emotional outcomes were considered to be the targets, the two most frequently occurring descriptors of 11 were "increase of interest" and "motivation to achieve." The two least frequently occurring descriptors were "emotional independence" and "emotional adjustment."

Product Availability

This category of product description information includes the purchase price and rental price of products identified in our search. Of the 332 products for which price information was available, the median purchase price is quite low, $3.00, although the mean is raised considerably, to $88.13, by a few very costly products. The median rental price of the 19 products for which this information was available is $45.00.

Nature of the Training Situation

This category includes information as to the materials provided with the product, the materials and equipment to be provided by the user, the time required to administer training, and the nature of the practice required during the training.

Materials provided with the product. The most frequently provided kind of material by far was the manual. Videotapes and games were the least frequently used.

Materials and equipment to be provided by the user. User-provided materials and equipment constitute a part of the cost of a product. The developers of teacher training products often use instructional technology other than the medium of print. Approximately 50 percent of the products required the user to provide nonprint materials, most frequently, tape recorders and film projectors.

Time required to administer training. Another major determiner of the cost of training is the number of hours required to complete training. It

was found that the number of hours ranges from 1 to 640, with a median of 8.

Nature of the skills' practice during training. The most frequently used activity was paper-and-pencil exercises. However, a substantial number of products involved direct experiences such as teaching students which is required with 141 products and teaching peers which is required with 77 products.

Field Test Results

Field test information for the products is summarized in Table 2. Of 657 products only 13 percent of the products indicated a reference to published field test results. For another 13 percent of the products, the source catalog stated that the product had been "field tested by the developer," and for 3 percent of the products a reference was made to unpublished data or to an unpublished report. There was either no field test or no information for 68 percent of the products. The broad outline of the field test information indicates that data are available in too few cases, in too little detail, and in a form too unavailable for evaluation by potential users or critics of the products.

Uses of a Computerized Catalog

In addition to aiding the analysis of the structure of the field of teacher training products, the computerized catalog has been used to further the Program's research effort which is to validate teaching skills in the cognitive, social-emotional, and organizational domains of behavior (see Clark, 1974). Employing descriptors appropriate to each domain of behavior, the Program staff has searched the catalog for products that train teachers in cognitive, social-emotional, or organizational skills. Those products which prove to be both relevant to the Program's emerging psychological model of the teacher and effective in raising skill performance levels will be combined into a flexible training system for both preservice and in-service teachers--the Systematic Teacher Training Model.

The Future of the Catalog

Use of the computerized catalog to date has established its potential utility for researchers, sponsors of product development, product developers,

and teacher educators. Sponsors of product development and product developers have successfully used the catalog to determine to what extent particular ideas for future product development are redundant with products already available. Teacher educators who are developing a competency-based program for preservice or in-service teachers might conceivably use the catalog to select training materials that address desired trainee competencies. Finally, the catalog might serve the needs of researchers who are investigating variables related to teaching effectiveness or curriculum and instruction.

In order to adequately meet the needs of potential users, several improvements must be made in the computerized catalog. First, the descriptors must be revised to be made more responsive to the needs of the various user groups. For example, one ambiguity in a catalog descriptor was discovered in doing a search for a product developer. The developer's proposed product used art and music as media of instruction but the skills taught were intended to be used by teachers of all subject matters. Although the catalog includes a descriptor for subject matter specificity, there is no distinction between the subject matter dealt with by the product and the subject matter typically taught by the target teacher. A second necessary improvement of the catalog is that the teacher training products must be obtained and reviewed firsthand. The present catalog and all previous catalogs have relied on descriptions of the products or on other secondary sources. Such a description process tends to decrease the reliability of the results obtained in a search of the product catalog. A firsthand review of the products by a trained panel of raters would facilitate the consistent and accurate description of the products on the selected dimensions. Finally, after the improved descriptions of the products are entered into the catalog, a search service could be made available to universities, funding agencies, school districts, research and development centers and laboratories, and individual researchers. This final step, however, depends on availability of additional funding to make the necessary improvements that have been outlined.

Summary and Implications

The results of the review of the field of teacher training products

have implications for four areas of Competency-Based Teacher Education--research on teaching, product development, product evaluation, and teacher training.

First, the vast array of available teacher training products assembled in the computerized catalog has the potential of serving as a toolbox from which the educational researcher can select an appropriate device for training the teaching skill that (s)he is interested in investigating. The need for research to validate teaching skills by producing changes in student outcomes is indicated by the absence of data on student outcomes for teacher training products in this catalog and by reviews of previous research on teacher effects (Rosenshine, 1971; Heath and Neilson, 1973; Dunkin and Biddle, in press). Researchers might also use training products as tools for studying and developing training principles. The current controversy (see Wagner, 1973) over whether motivation to change behavior and discrimination training are sufficient conditions for changing teacher behavior suggests the need for research on principles of training.

Secondly, product developers might take heed of the current state of the field of teacher training products. Product development, thus far, seems to have been affected by certain waves of fadishness as illustrated by the preponderance of products which deal with behavioral objectives. Nearly a third of the training products address the skill of preparing objectives, and 32 products seem to focus exclusively on preparing objectives as evidenced by such product titles as "Writing Behavioral Objectives," "Establishing Performance Objectives," and "Identifying Affective Objectives." The necessary direction for product development seems to be toward the development of products which consider student outcomes as the ultimate target of teacher training and which reflect a concern for the wide variety of teacher needs. For example, the end product of the Program on Teaching Effectiveness, the Systematic Teacher Training Model, will incorporate teaching skills that have been shown to be effective in improving student outcomes.

Third, the results of the review demonstrate the clear need for product evaluation. However, the finding that the number of existing products is already very large and ever burgeoning suggests that individual product evaluation would be a costly endeavor. One solution, which is

being attempted by the Program on Teaching Effectiveness, is to group products on similar dimensions and then evaluate the different dimensions. One might find, for example, that products which teach concepts through reading and programmed exercises are less effective than products which teach concepts through discussion with peers. A second solution is to develop training systems which include their own capability for evaluation. Indeed, the most important feature of the Systematic Teacher Training Model will be its capability for continuous formative evaluation and evolution toward a more effective system.

Finally, a computerized catalog provides a means by which teacher educators who are faced with the task of converting to a competency-based program can select a particular type of training product to teach a desired competency from the previously undifferentiated multitude of available training materials. The logical extension of a catalog would be to build a storehouse of teacher training products in which a teacher educator could peruse the actual product before deciding to incorporate the product into a system. A repository would give the buyer an opportunity to assess what (s)he was buying and might improve the quality of products on the market through self-selection--the "better" products would be bought, and the others would either be improved or would drop out.

In conclusion, this review constitutes a census of the products of "first generation" CBTE. As proud parents are wont to do, one could look toward the new generation of products that are now being born as the hope and promise for the future. However, that promise can only be realized if the "second generation" CBTE offspring, like the Systematic Teacher Training Model, represent an adaptive response to past inadequacies and a gradual evolution toward an improved species.

TABLE 1

Support Contexts in Which Teacher Training Products Are Developed

Support Context	N	%
Universities	352	53.6
R&D Centers and Laboratories	93	14.2
School Systems	46	7.0
Private Organizations	23	3.5
Unknown	143	21.8

TABLE 2

Frequencies and Percentages of Type of Field Test Information Available

Type of Field Test Information	N	%
Reference to Published Field Test	87	13%
"Field Tested by Developer" Statement in Catalog Description	83	13%
Unpublished Data or Report	22	3%
Developer's Letter Suggested Positive Results	7	1%
Field Test Planned or in Progress	12	2%
No Field Test or Results Available to Developer Only	77	12%
No Information	369	56%
Total	657	

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Heath, R. W., and M. A. Neilson. "The myth of performance-based teacher education." Paper presented to the American Education Research Association, February 1973.

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Rosenshine, B. Teacher behaviors and student achievement. London: National Foundation for Educational Research in England and Wales, 1971.

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APPENDIX A: Product description form showing the number of products having a given descriptor. The total number of products reviewed was 657.

Product ID_____

Product Title: _____

Developer (Organization and/or Individuals): _____

_____

(Address) _____

_____

Supplier: _____

(Address) _____

Source(s) of Reference Information: _____

_____

Subject Matter Specificity

Topic within subject matter

435 None
57 Reading
5 Foreign languages_____
33 Other language skills (English)_____
36 Mathematics
21 Science
39 Social studies
0 Physical education
12 Music
6 Art
19 Others_____
13 Bilingual or Multicultural*

Target Audience

Role

597 Preservice trainees
547 Inservice teachers
69 Administrators
64 Teacher aides
61 Supervisors
56 Teacher educators
22 Others_____

Grade level

313 Teachers in general
288 Elementary teachers
112 Junior high teachers
119 Secondary teachers
9 Junior college teachers
13 College teachers
22 Others_____
18 Early childhood*

Target Teacher Outcomes

476 Planning skills
195 Selecting instructional materials
67 Obtaining instructional materials
204 Preparing instructional materials
48 Interaction with teachers in planning
52 Teacher-pupil planning
315 Selecting instructional process strategies
101 Arranging the instructional environment
47 Selecting behavior modification strategies
44 Others_____
21 Organizing students*
26 Developing procedures and routines*
40 Evaluating instruction and instructional design*

*This descriptor was added to the form after the review was commenced. This descriptor was available for use with only 359 products.

369 Presentation skills

- 59 Listening
- 74 Explaining
- 85 Questioning
- 47 Giving examples
- 30 Pacing
- 54 Introducing
- 54 Sequencing
- 37 Summarizing
- 100 Individualizing instruction
- 19 Emphasizing
- 53 Stimulating
- 95 Using groups
- 23 Gestural behavior
- 21 Reviewing
- 125 Motivating
- 114 Reinforcing
- 75 Eliciting feedback
- 31 Using games
- 6 Managing field trips
- 40 Using AV equipment
- 9 Giving homework
- 30 Preventing disciplinary problems
- 2 Substitute teaching
- 67 Other_____
- 40 Structuring, establishing rapport, providing atmosphere*
- 37 Utilizing deductive, inductive thinking, or problem solving*

194 Skills in the unplanned aspects of teacher behavior

- 45 Managing student (problem) behavior
- 82 Providing feedback
- 98 Informal interaction with students
- 32 Interaction with parents
- 45 Interaction with other teachers
- 32 Interaction with supervisors
- 37 Interaction with staff
- 43 Use of student ideas
- 12 Other_____

403 Assessment and evaluation skills

- 184 Preparing objectives
- 101 Measuring student entry behavior
- 40 Selecting tests
- 66 Constructing tests
- 146 Assessment of student cognitive behavior
- 95 Assessment of student social-emotional behavior
- 118 Evaluation of student cognitive behavior
- 72 Evaluation of student social-emotional behavior
- 58 Reporting procedures and record keeping
- 100 Teacher self-observation
- 55 Other_____
- 11 Collecting and quantifying data*
- 22 Involving students in self-evaluation*

172 Affective outcomes

- 26 Ethics and values about teaching profession
- 58 Attitudes toward teaching
- 38 Teacher self-concept
- 28 Teacher locus of control
- 46 Job satisfaction
- 39 Attitudes toward subject matter
- 76 Attitudes toward students
- 56 Motivation to achieve
- 47 Ability to get along with others
- 16 Other_____

159 Other skills

- 4 Applying for a job
- 0 Collecting and administering money
- 1 First aid
- 8 Moving groups of students
- 6 Playing games/supervising recreation
- 41 Other_____
- 4 Representing school and school programs *
- 11 Involving others in school programs*
- 81 Developing subject-related skills*
- 37 Solving problems*

Target Student Outcomes

218 Cognitive

- 139 Acquisition of information
- 120 Comprehension of information
- 112 Application of information
- 61 Creativity
- 73 Intellectual independence
- 28 Other_____

*This descriptor was added to the form after the review was commenced. This descriptor was available for use with only 359 products.

142 Social-Emotional

19 Emotional adjustment
62 Increase of interest
48 Motivation to achieve
42 Change of beliefs and attitudes
39 Improvement of self-concept
25 Learning of social roles
32 Learning of values
23 Engendering internal locus of control
26 Decrease of disruptive behavior
18 Emotional independence
40 Ability to get along with others
6 Other _____

Product Availability: Available now: Purchase price $_____
Rental price $_____
Cost per t $_____
Soon available: _____

Nature of Training Situation

Materials provided with product: 485 manuals; 26 games; 84 films; 35 videotapes; 89 audiotapes; 161 other _____

Materials and equipment to be provided by user: 55 VTR recording equipment; 76 VTR playback; 101 film projector; 145 tape recorder; 29 slide projector; 87 filmstrip projector; 169 other _____

Time required to administer: Total number of hours _____
Recommended length of units _____

Personnel required to administer training

18 Outside consultant
243 Supervisor or leader familiar with materials
258 Self-administered
91 Other _____

Number of trainees using training at one time: Minimum _____
Maximum _____

Nature of skills practice during training

372 Paper and pencil exercises
7 Teaching to peers
141 Teaching to students
246 Other _____

Skills learned during training are used:	largely	sometimes	never
prior to interaction with students	378	143	105
during interaction with students	354	161	113
after interaction with students	168	198	259

References describing field test results

_____

_____

Additional descriptive and evaluative comments

_____

_____

Prepared by _____ Date _____